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PRELIMINARY LIST OF THE MACRO-LEPIDOPTERA OF ALBERTA, N.-W. T.

BY F. H. WOLLEY DOD, MILLARVILLE, ALBERTA.

(Continued from page 94.)

488. *Hydriomena quinquefasciata*, Pack.—Very common. Middle July to middle Aug. Exceedingly variable. The specimens that I have from the mountains (Banff) are duller in colour than those taken nearer Calgary, with less green. Mr. Taylor says: "It is best for the present to use the name *quinquefasciata*, Pack., for the moth we have been calling *sordidata*. It is probably the same as the *sordidata*, Fabr., of Europe (but a good variety), but it is not the *sordidata* of Packard's Monograph, which I think must bear Packard's name, *nubilifasciata*."

489. *H. ruberata*, Freyer.—Mr. Taylor says: "This species, which stands in most of the collections as *trifasciata*, is, I think, really *ruberata*, Freyer, of which I have English specimens. The *trifasciata* of Packard was not the *trifasciata* of Borkhausen, which = *autumnalis*, Ström." My records up till 1905 were June and early July, and I never saw it at all common. But during the present season (1906) the males have come rather freely to outdoor light between May 10th and 14th.

489a. [*H. autumnalis*, Ström.—Of a specimen taken by Mr. Hudson at Springbank, near here, on May 30th, 1905, Mr. Taylor said: "More like European *autumnalis* than most others I have seen." The specimen was much more strigate and less obviously banded than any *ruberata* I had previously seen, and certainly suggested another species. But after comparing it with some of the more recent captures of *ruberata* above mentioned, I am doubtful of its distinctness therefrom. I have compared this specimen with the species in Mr. Cockle's collection at Kaslo, recorded as *autumnalis* in the Kootenai list, and believe it to be entirely distinct.]

490. *H. multiferata*, Walk.—Two specimens near Billings's mill, July 3-7, 1895, and June 19th, 1898.

491. *H. custodiata*, Gn.—A male at light on Pine Creek on July 18th, 1903, and a female flying in the daytime by the Red Deer River, north-east of Gleichen, on July 4th, 1905. Mr. Taylor tells me that Dr.

Holland's figure under this name is really *H. excurvata*, of which I have specimens from Victoria, B. C. The species bear no resemblance to one another.

492. *Triphosa indubitata*, Grt.—A male on October 22nd, 1902. The name stands in Dr. Dyar's list as a synonym of *progressata*, Walk., which Mr. Taylor tells me is not North American.

493. *Cænocalpe magnoliata*, Gn.—Two specimens only, one on July 30th, 1893, near mouth of Fish Creek; the other here in the hills at light, June 26th, 1903.

494. *C. polygrammata*, Hulst.—A badly rubbed male on July 3rd, taken by beating in daytime, and a fine female three days later, both on the Red Deer River, about 50 miles from Gleichen. The first record for the species in Canada, according to Mr. Taylor.

495. *C. topazata*, Strk.—Probably not rare in the spruce. I have only two specimens at present, June 5th and July 5th, "Billings's mill."

496. *Gypsochroa designata*, Hfn. One on July 2nd, 1893, near mouth of Fish Creek, and a male at light at the Red Deer River locality on July 4th, 1905. The localities suggest a prairie rather than a mountain species.

497. *Xanthorhoe incursata*, Hbn.—I have taken it somewhat sparingly amongst the spruce near Billings's mill, and in the mountains near the Lake Louise Chalet at Laggan, almost up to the limit of timber, the highest-up capture being at Mirror Lake, about 6,500 feet. End June and July. The species occurs in B. C., but is not common.

498. *X. abrasaria*, H. S.—A mountain species. I have it from Laggan, Banff (top ridge of Sulphur Mt., 8,000 feet), Lineham's lower log camp, and Billings's mill. The latter place is almost the eastern limit of the spruce, beyond which it does not seem to occur. Not rare. Middle July to middle Aug.

499. *X. munitata*, Hbn.—A common and very variable insect, in which the sexes might easily be mistaken for two species. The ground colour of the males is dull pearly gray, and there is a strong tendency for the central purplish band to become constricted in the submedian interspace. In one of my specimens the blackish defining lines actually touch. The females have as a rule the ground colour tinged with ochreous, and have a wider band. A female from Laggan, taken above timber (over 6,500 feet), on Slate Mt., differs so in the band from any of my Calgary specimens, that I felt sure it was a distinct species, but Mr.

Taylor has seen it, and refers it to this series. The band is very much redder, more uniform in colour, has not nearly such distinct reticulation, and is bordered by narrow dark lines instead of irregular shades. I took a closely similar female near the Chalet at Laggan, below 6,000 feet, on July 14th, 1904. The only other *munitata* which I have from the mountains is a typical male. Mr. Taylor says of a picked series I sent him: "I am calling it *munitata*, but our western *convallaria* is very like it. It is *not* our British Columbian and Californian *defensaria*." I am indebted to Mr. Taylor for Wellington specimens labelled *convallaria*, and though forgetting that he had sent me the above note, found myself unable to distinguish them from the Calgary species. *Defensaria*, which I have from both Wellington and Kaslo, differs, amongst other respects, in the less concave anterior edge of the band. In the Kootenai list, recording *convallaria*, Gn., as common in that district, Dr. Dyar says: "Hulst's *nemorella* from Alaska is scarcely more than a variety of this, and both will be found to unite with the European *munitata*, Hbn." End June to early Aug.

500. *X. ferrugata*, Clerck.—Common. Middle June to middle July.

501. *X. circumvallaria*, Taylor (CAN. ENT., XXXVIII, 205, June, 1906*.)—Fairly common in the spruce near Billings's mill. My only dates are June 19th and 24th. I have not yet heard of it from any other locality. Easily distinguished from any other geometer occurring here by having a well-defined blackish outer border to the secondaries.

502. *X. fossaria*, Taylor, MSS.—About ten specimens at Agnes Lake, Laggan, 6 850 feet, just below the timber line, on July 20th, 1904. Wellington specimens (June 15th to 30th, in my collection) are much more clearly marked, and look to me like another species. Specimens in Mr. Taylor's collection from Stickeen River, in northern B. C., are, however, somewhat intermediate. Mt. Cheam specimens are exactly like those from Laggan.

503. *Synelys enucleata*, Guen.—Two specimens from the Red Deer River locality, taken by beating bushes in the daytime, on July 5th and 6th, 1905. Both in fine condition. One is exactly like Dr. Holland's figure under the name *alabastraria*. Of this specimen Mr. Taylor says: "It is *alabastraria* of the lists, but really a var. of *enucleata*, Gn. *Alabastraria* is European only." The other specimen, which Mr.

*"This is a form of the European *turbata*, Hbn." (L. B. Prout, in litt.)

Taylor labelled *enucleata*, entirely lacks the outer band, but has the inner and central lines more distinct. I was inclined to believe them two species.

504. *Cinglis ancillata*, Hulst.—Not common. End July and early Aug.

505. *C. sp.?*—A male near Billings's mill on July 19th, 1905, is obviously distinct from anything else here listed, and I have taken one or two other specimens at any rate nearly related to it. Names have not yet been found for them.

506. *Leptomeris quinque-linearia*, Pack.—The males as a rule are taken fairly commonly at light and by beating, in July. It is common at head of Pine Creek, and on Red Deer River, and I have it from near Billings's mill, where I took one of the only two males I ever saw here. The other is from Lineham's log camp, in the foothills on Sheep Creek. The local series differs from specimens sent me by Mr. Taylor from Wellington, in being considerably smaller, having the lines as a rule less distinct, especially the fine black terminal one at base of fringes, which is often absent. A Cartwright (Man.) specimen agrees with the Calgary series. Mr. Taylor has not suggested a distinct species.

507. *L. sentinaria*, Hbn.—Common on the prairies, not common in the hills. Middle June and early July. It is probable that I have more than one species under the name.

508. *Eois persimilis*, Hulst.—A single specimen on July 25th, 1901, probably taken at light at head of Pine Creek. I sent the specimen to Mr. Taylor three years ago, retaining *L. 5-linearia* as a duplicate, an error which caused me endless confusion over the two names until I saw both species in Mr. Taylor's collection last March. Differences which he then pointed out to me are:—more even outer line (in *persimilis*), general indistinctness of lines, and almost rounded secondaries. I am not aware that I have taken another like it. The species was described from Quebec and Ontario. Hulst says in the description: "Sent by Mr. Hanham, of Winnipeg. The species seems to be midway in some respects between *E. inductata* and *E. 5-linearia*. Mr. Hanham writes me *inductata* is taken at Winnipeg in abundance on the open prairies, while this species he has only taken in dark woods." These remarks are probably not intended to imply that *persimilis* occurs near Winnipeg.

509. *E. inductata*.—Very common some years, frequenting the open prairies as well as the hills. A day flier, and comes freely to light.

Early July to middle Aug. A very variable species. I am not aware that I have taken more than one female.

510. *E. Hanhami*, Hulst.—Fairly common in the hills, but I have not so far met with it on the Red Deer prairies, where most of the other "waves" occur. Middle June to middle July. Described from Winnipeg. "Closely allied to *5-linearia* and *persimilis*, but with much more rounded wings, and the two outer lines different in direction." It is a whiter species than my *5-linearia*, and beneath it is far more smoky, lacking the conspicuous yellowish costa of that species. It also differs considerably in wing form. I have compared Kaslo specimens of the species recorded by Dr. Dyar in the Kootenai list as *rotundopennata*, Pack., for which I am indebted to Mr. Cockle, and am unable to distinguish them from this species.

511. *Annemoria bistriaria*, Pack.—A male at light at the Red Deer River locality, on July 5th, 1905.

512. *Eucrostis viridipennata*, Hulst.—Rather common some years. Middle May and June. Mouth of Fish Creek and head of Pine Creek. Fresh specimens are of a beautiful dark emerald, but it is the most fleeting green I know. It soon fades in life, and it is quite impossible to relax a good specimen without its turning to a dirty yellowish green or brownish yellow. If set fresh it keeps its colour fairly well. It was described from Colorado, but Hulst had a Calgary specimen from me, and called it *viridipennata* more than a year before the description was published. I obtained ova in 1905, and find a note that they hatched on June 2nd, and that the larva fed on *Salix*. They produced moths the following spring, but none were preserved. A day flier.

513. *Synchlora glaucaria*, Gn., = *aerata*, Fabr.—Not common. Head of Pine Creek, end June and July. I have not seen it elsewhere. Weather bleaches it from green to pale luteous, but the colour is not as fleeting as in the preceding species, nor does relaxing injure it. A specimen that Mr. Taylor has from me differs, he tells me, from all other described species of the genus in having a considerable portion of the usual green on secondaries replaced by white. None of my other specimens, however, show this variation.

514. *Aplodes Hudsonaria*, Taylor (CAN. ENT., XXXVIII., 206, June, 1906).—Seven males, at dusk and light, on the Red Deer River, north-east of Gleichen, whence the species was described, and named after Mr. Arthur F. Hudson, its first and principal

captor. The dates are July 5th and 6th, 1905, and some of the specimens are in very fine condition. Mr. Taylor, to whom I am indebted for a co-type, says that it differs obviously from its allies in that the cross lines on the secondaries disappear in the submedian interspace, instead of reaching the inner margin.

515. *Epelis truncataria*, Walk.—Not common. End May and June. A day flier. The species agrees with Dr. Holland's figure.

516. *E. Faxonii*, Minot.—A specimen in Mr. Taylor's collection, taken by Mr. C. Garrett on Fallen Timber Creek, about 20 miles west of Didsbury, on June 25th, 1904. Another specimen in my own collection, from the same locality, but dated May 28th, is probably the same species. The specimens have a much closer resemblance to *Dasyfidonia avuncularia* than to *E. truncataria* of Dr. Holland's figures. Mr. Taylor says: "*Faxonii* is not a synonym of *truncataria*. There is an error here in Dr. Dyar's list."

517. *Eufidonia notataria*, Walk. — Fairly common. } End May and June.

518. *Orthofidonia semiclarata*, Walk. — } Both day fliers.
Common most years.

519. *Deilinia borealis*, Hulst.—Described from a pair from here. I have it from the mouth of Fish Creek westwards to Billings's mill. Not common. Middle June to early July. A day flier. No comment is made with the description, so I presume it had at the time no known close allies. But Mr. Taylor tells me that Hulst's *D. solamata*, described five years later from Manitoba, is nearly related to it, but is much darker.

520. *D. variolaria*, Gn.—Fairly common. July. The species is pure white, faintly peppered with gray or smoky, and has no transverse lines. In the latter respect it is quite unlike Dr. Holland's Pl. XLIII, fig. 36, which Mr. Taylor tells me is really *erythremaria*.

521. *D. erythremaria*, Gn. ?—Rather more common than the preceding. Mr. Taylor is in some doubt about the name. They are more gray powdered and less yellowish than typical specimens. A pair from Red Deer River have less powdering and yellowish lines, and may possibly be the true *erythremaria*. End June and July.

522. *Sciagraphia granitata*, Gn.—Common in the spruce, upon which, Dr. Dyar tells us, the larva feeds. A day flier. June and early July. A small male taken by Mr. C. Garrett on Fallen Timber Creek, about 20 miles west of Didsbury, on June 14th, 1904, has been placed in this series by Mr. Taylor, but looks to me distinct.

523. *S. denticulata*, Grt.—Common. June, July and Aug. It appeared this year on May 10th. A day flier. The ground colour is normally pale gray, but a purplish suffusion, in some specimens hardly apparent, in others obscures at least half the ground. The extremes might easily be taken for two species. One of my Red Deer River specimens, a female, has the ground obscured almost completely.

524. *S. continuata*, Walk.—Not common. Middle June to middle July. Dusk, light and treacle. It is possible that I may have two species under this name. In the more usual form the t. a. and t. p. lines are well defined, broad, and dark sooty brown or black. A less common variety has these lines very pale, narrow and faintly defined, most of my specimens of this form being females. I certainly have not every intergrade between the two, but in all other respects they appear to overlap. A male without the black lines was called *sinuata* by Hulst some years ago. Mr. Taylor has seen a series, including this specimen, but has failed to make any satisfactory separation. A female from Fallen Timber Creek, west of Didsbury, taken by Mr. C. Garrett on June 13th, 1904, has been referred as a small specimen of this species by Mr. Taylor. The maculation is not unlike that of some specimens in the series lacking the black lines, but I suspect it of being a different species. I have stronger beliefs in the distinctness of a short series from the Red Deer River, which I believe I can distinguish by their being grayer, having a smaller and less open discal spot, and a more distinct purplish band beyond the t. p. line. Mr. Taylor associates this with the Calgary form, which I have also from the same locality.

525. *S. mellistrigata*, Grt.—Two males from head of Pine Creek, July 24th, 1901, and Aug. 9th, 1902. Both at light.

526. *Philobia enotata*, Gn.—A male in perfect condition, July 4th, 1898; Billings's mill. Mr. Taylor has a male from me dated June 24th, 1899, but without definite locality. Probably not rare in the spruce.

527. *Diastictis (Cymatophora) sulphurea*, Pack.—Common everywhere: End July to middle Aug. in the Calgary district, but at the Red Deer River locality it is on the wing in early July. I rarely see a female. A day flier, and comes to light.

528. *D. flavicaria*, Pack.—Common. July and early Aug. Comes to light. I have a specimen of both this and the preceding named *flavicaria* by Hulst, but the two are easily separable as species. The usual form is pale lemon yellow, but a few specimens, with no real intergrades,

are of a dull washed-out smoky luteous, having but the faintest tinge of lemon, or sometimes none at all. One of these has been labelled *evagaria* by Hulst, but up to the time of writing Mr. Taylor had not seen this specimen. A Chicago specimen in Mr. Taylor's collection which he has identified with Hulst's *flavicaria* is not, however, very sharply distinct from some of the brownish or luteous specimens in the Calgary series. A specimen in his collection agreeing with Packard's figure and description of *occiduaria*, but having no data, looks like Calgary *flavicaria*, but is much brighter yellow. The plan of maculation is exactly the same in the two Calgary forms. I never saw a female of either.

529. *D. brunneata*, Thunb.—Not rare. Middle July to middle Aug.

530. *D. Hulstiaris*, Taylor, = *subalbaria*, Hulst, nec Pack. (CAN. ENT., XXXVIII, 112, April, 1906). A male from head of Pine Creek, taken on June 5th, 1897, is in Mr. Taylor's collection. I had had the specimen standing in my series of *Deilinia variolaria*, and, according to Mr. Taylor, Dr. Dyar fell into the same trap in recording this species as *variolaria* in the Kootenai list. I believe, however, that I saw both species in Mr. Cockle's collection. Hulst, in the description of *subalbaria* compares the species with *erythremaria*, not *variolaria*. *Virginalis*, Hulst, seems to be an extremely close ally.

531. *D. denticulodes*, Hulst.—Two male specimens at light, July 22nd and 25th, 1905, one in fine condition, but the first capture rubbed. Mr. Taylor says these are the first records for Canada. They bear a striking resemblance to *Sciagraphia denticulata*, but are slightly larger, though I recognized them on sight as something new to me. It was described from Colorado, and the entire description is: "A species almost the exact counterpart of *S. denticulata*, Grt., in appearance, from some specimens of which I am not able to distinguish it by colour or markings. It is, however, easily distinguished by the bipectinate antennæ of the male, and the sharply serrate antennæ of the female." It is not unnatural to suppose that *-oides* was the termination which Hulst intended to be printed, but the fact that the name is spelt the same way in the list of species on the same page is at variance with the suggestion.

532. *D. sp. ?*—Rare.

533. *D. sp. ?*—Rather rare. Has rather heavier antennæ than the above, subapical mark less produced, and in the subterminal band more closely resembles No. 534. I had this and the preceding mixed until

recently. Mr. Taylor says concerning them: "Two *Diastictis* of the *inquinaria* group." But he is not able to name them at present. The only female I ever saw of either was bred on July 15th, 1894, from a larva beaten from *Salix* at the mouth of Fish Creek in early spring. This was named *bicolorata* by Hulst, but Mr. Taylor says it does not fit the description. End July and Aug. In the Kootenai list *inquinaria* is recorded from Kaslo. I have seen and compared a series in Mr. Cockle's collection with both these species. One of his specimens is the same as my 533. The others are nearer to No. 532, but have heavier antennæ.

534. *D. loricaria*, Eversman, = *Sympherta julia*, Hulst.—Until two years ago the female of *julia* was unknown. Meanwhile Messrs. L. B. Prout and G. W. Taylor suspected its identity with a European species, and the capture by me at treacle of a female with rudimentary wings, on Aug. 2nd, 1904, which I had reason to suspect of being *julia*, confirmed their suspicions. Mr. Taylor writes: "*Sympherta julia*, Hulst, is really *Dysmygia loricaria*, Eversman, a European species, described in 1837, which has a short-winged female." The species stands in the Staudinger Catalogue under *Thamnonoma*, which now gives place in our lists to *Diastictis*. *Julia* was described from Ontario, Washington, Calgary, Glenwood Spgs., Colo., and Montana. If the reference of the Calgary species is correct, the description is somewhat misleading. To begin with, the description of the genus *Sympherta* says: "Antennæ bipectinate in the male, the pectinations rather short." I know very few species of Geometridæ in which the pectinations are longer, compared with the length of the antennæ. Again, the description of *julia* tells us that "a submarginal whitish dentate line, parallel with outer margin," runs through the outer reddish-brown band, "having on the inner side a series of dark spots, especially marked at veins 3 and 4, and at 6 and 7." As a matter of fact, the whitish line, always faint, and sometimes obsolete, is wholly posterior to the band, of which the "series of dark spots," a prominent feature, form the outer border. The species bears a strong resemblance to the preceding (No. 533), but differs in the more heavily pectinated antennæ, the larger, browner and more open discal spot, and more distinctly oval brown spots in the centre band. The males are not rare. Middle July to middle Aug.

535. *D. sp.?*—A small, poorly-marked, smoky brown species, not uncommon near the timber line (6,500–7,000 feet) at Laggan. Mr.

Taylor tells me that he has it also from Banff, and from Yellowstone Park, Wyo., but is unable to name it at present. End July and Aug.

536. *Plataea trilinearia*, Pack.—Fairly common on the Red Deer River bottom in early July, where it may frequently be disturbed from some of the larger species of sages so abundant in that district, including *Artemisia ludoviciana*, on which the larva, perhaps feeds. Mr. Taylor comments: "The capture of *Plataea* is interesting. I did not know it before from Canada, except a single B. C. specimen, which I thought might be an error."

537. *Paraphia subatomaria*, Wood.—Four males and a female on Red Deer River between July 2nd and 5th, 1905, chiefly by beating. The males are all more or less worn. The female, which is in good condition, is the largest of the series, and has more obvious scalloping. It closely resembles Dr. Holland's figure of *unipuncta*, which Mr. Taylor tells me is merely a variety of the same species. I had imagined the female to be distinct from the male. My specimens appear to be grayer than anything in Mr. Taylor's series, though similar in pattern.

538. *Spodolepis substriataria*, Hulst.—The name is so spelt in the description, which was taken from a single female from Franconia, N. H. A specimen was taken at Sallow blossom in early spring by Mr. Hudson some years ago. Both Mr. Taylor and Dr. Dyar have seen this, which is defective, but not rubbed, and named it as above. Two more have been taken during the present season. One at Sallow blossoms on April 23rd, the other, slightly rubbed, at light on May 11th. The first capture has the ground colour ochreous, and the black transverse lines very distinct. The two latter are fuscous throughout, and in the darkest of these the transverse lines are rather faint. All these have a whitish discal spot situate in a blackish cloud. The cloud, but not the spot, is referred to in the description. Mr. Taylor writes: "The species is immensely variable. According to Dr. Dyar, *Jubarella Danbyi* must be sunk as a synonym of *substriataria*. There appears, however, to be some doubt as to whether this is the case." Both genus and species of *Danbyi* were described from Rossland, B. C., from a male only, the female being mentioned as "unknown, possibly wingless." "Discal spot white, with edging dark," is a character of *Danbyi*, of which the description otherwise fits the Calgary species pretty well, except that instead of blackish cross lines *Danbyi* is stated to have a few black dashes on some of the veins only. Since receiving Mr. Taylor's note on the subject, I have carefully examined a

splendid series in Mr. Cockle's collection, including both sexes, winged, the species being recorded from that locality in the Kootenai list as *substriataria*. I was unable to make two species out of them, but found the variation enormous. Apart from that in shade and suffusion, the white discal spot was sometimes lost, or nearly so, and the black cross lines, sometimes very conspicuous, were in some specimens almost obsolete, and in one instance reduced to slight black dashes on two veins only.

539. *Selidosema umbrosaria*, Hbn. ?—Five males and a female from Red Deer River, July 1st to 7th, 1905, at light and by beating. Mr. Taylor has one of the males, but in only one of the other four am I unable to detect a hair pencil on the hind tibia. From the fourth it has probably been rubbed off in the pinning. Mr. Pearsall's remarks, in CAN. ENT. XXXVIII, p. 178, (May, of this volume), concerning the absence of hair pencil in Hubner's species, leaves me in doubt as to the correctness of the determination.

540. *Lycia cognataria*, Gn.—Three pairs only have been taken, though it seems at any rate widely distributed in Alberta. At rest and at light, June and early July.

541. *Apocheima Rachelæ*, Hulst.—Four or five males only have been taken, the captures extending over a period of six years. On the wing at daytime, or at rest. Head of Pine Creek, April and early May. Perhaps the earliest of all the spring-hatching Lepidoptera. Described from Colorado, recorded also in Dyar's list from Alaska, and Mr. C. V. Blackburn tells me that he has taken several males at light in early April at Woburn, Mass., the identification having been corroborated by Prof. J. B. Smith, who I believe has the type. So it appears to have a wide range. Mr. Taylor tells me that the female is wingless, and that he has it in his collection. I have not taken it near salt springs, as Mr. Bruce did in Colorado.

542. *Dyscia orCIFERATA*, Walk.—Common, but more so on the prairies than in the hills. A day flier. June and early July.

543. *Anagoga pulveraria*, Linn.—Two specimens, both taken near mouth of Fish Creek, June 6th and 7th, but at an interval of ten years. I collected there for two years, and only remember seeing one, but I cannot be sure that it is not common there some seasons.

544. *Sicya macularia*, Harr.—Common. End July to early Sept. A very variable species, with a striking dissimilarity between the sexes. I have the name "*var. crocearia*" from Hulst, but cannot be sure to which form it refers.

545. *Metrocampa perlata*, Gn.—Very common, sometimes rather abundant, particularly in poplar thickets. Dusk, and occasionally at light, in July. This, Mr. Taylor tells me, is the common and widely distributed pale green species standing in our lists as *prægrandaria*, Gn., and is the N. American representative of European *margaritata*, Linn. But *prægrandaria*, he says, was described as a reddish flesh-coloured species, with thorax sulphur-yellow. The species seems to be unknown, and the description may have been from a European specimen (*honoraria*, Schiff.) in error.

546. *Ennomos magnarius*, Gn.—Not common. End Aug. to middle Sept. Light. Mr. Hudson bred a fine female from a larva feeding on *Populus tremuloides*.

547. *Xanthotype cecataria*, Fabr.—Not rare on the Red Deer River in early July, 1905, but getting rather worn. Taken principally at light, and apparently all males. Most of the specimens are more heavily banded, but less speckled, than Dr. Holland's figure, and a few closely resemble that of var. *cælaria*.

548. *Hyperitis amicaria*, H. S.—In about equal numbers to the preceding species, at the same time and place, but taken almost entirely by beating willow bushes in the daytime.

549. *H. trianguliferata*, Pack. = *notataria*, Hulst. Not common. End May to early July. Daytime and light. I have a specimen which was returned to me as "*trianguliferaria*, var. *notataria*," by Hulst, though in his "Classification," published a year later, he lists the names as distinct. The specimen is a male, and has a well-marked dark spot on inner margin of primaries, which in others of my series is entirely lacking. I have only five males and a female at present under examination, but the series is such as to convince me that the extremes are one species. Dr. Dyar, in the Kootenai list, draws the same conclusion from a long series taken in the Kaslo district. I never suspected the existence of two amongst my local material. The use of either as a varietal name is, however, superfluous, as Mr. Taylor writes: "Packard's type of *trianguliferata* is the form afterwards described as *notataria* by Hulst. The *trianguliferata* of Hulst (nec Pack.) is the less spotted var." *Notataria* is therefore a synonym, as both names refer to the form with the spot on hind margin.

550. *Euchlæna obtusaria*, Hbn.—Not rare at light on the Red Deer in early July, 1905.

551. *E. Johnsonaria*, Fitch.—Comes freely to light, and flies at dusk. July.

552. *E. astylusaria*, Walk.—A male on the Red Deer, July 8th, 1905, slightly rubbed.

553. *E. pectinaria*, Schiff.—A fine male at light in the same locality, on July 5th.

554. *Selenia (Eutrapela) alciphearia*, Walk.—Common some seasons, notably in 1900 and 1906, but sometimes rare or absent. Light and dusk. May.

555. *Pherne jubararia*, Hulst.—Two males on the wing after dark, Sept. 17th, 1903. Mr. Taylor tells me that it occurs on Vancouver Island, and "has been passing in collections as *Sabulodes aurantiacaria* and *S. cervinaria*." The specimen of these two, which is now in my collection, and which Mr. Taylor has seen, has much less of the ochreous coloration than the figure of the female type in Dr. Holland's book, and the outer line is rather less waved. A third male, taken at light on Sept. 30th, 1904, is slightly rubbed, and bears a much closer resemblance to Dr. Holland's fig. of *placearia*, and has almost immaculate secondaries. Mr. Taylor has not seen this, and I dare not separate on the one specimen.

556. *Metanema inatomaria*, Gn.—A pair near Billings's mill, June 26th, 1898.

557. *M. determinata*, Walk.—Rare. Early June to early July.

558. *Azelina ancetaria*, Hbn.—Not common. June and July. Light.

559. *Sabulodes lorata*, Grt.—A female, much worn, on the Red Deer, July 1st, 1905. The wings seem longer, and are more falcate, than in Dr. Holland's figure.

560. *Brephos infans*, Möschl.—Taken by Mr. Thomas Baird, of High River, Alta., and at Banff by Mr. N. B. Sanson. Both on the authority of Dr. Fletcher. (Rep. Ent. Soc. Ont., No. 19, p. 96, 1902.)

PSYCHIDÆ.

561. *Hyaloscotes* (?) *fragmentella*, Hy. Edw., = *fumosa*, Butl.—A specimen flying in hot sunshine near the summit of Mt. St. Piran, Laggan, at about 8,500 feet, on July 20th, 1904. The specific synonymy is on the authority of Dr. Dyar, who has seen my specimen, and in returning it commented: "It is *Chalia fragmentella* and *Hyaloscotes fumosa* combined."

COSSIDÆ.

562. *Cossus Centerensis*, Lint.—A rather worn male at light, July 18th, 1902. The specimen was so named by Dr. Barnes, and is not unlike Dr. Holland's figure of that species. Dr. Fletcher has seen it, and doubts the correctness of the name, saying: "It looks too clean."

563. *C. populi*, Walk.?—Probably not rare. A large number of balsam-poplar trunks (*P. ba'samifera*) are burrowed with what I believe to be this species. I have bred a few from larvæ taken from split wood, or rather left in blocks of sawn or split wood. If removed from their burrows the mortality amongst them will probably be high. Dr. Ottolengui has the species from me, but could not name it with certainty, and I have a specimen referred doubtfully to *populi* by Dr. Dyar. Two males and a female are all I have now in the collection, and they show considerable variation. Two males only have been taken at light, which has not been worked near their breeding ground, and besides these I have never met with any except by breeding. July and early Aug.

564. *Prionoxystus robinie*, Pack.—One female in a freshly-built Cottonwood (*Populus deltoidea*) log building on Red Deer River, on June 21st, 1907.

SESIIDÆ.

565. *Bembecia marginata*, Harr.—A pair at rest on a Cottonwood trunk on Red Deer River on July 10th, 1904. Dr. Dyar has seen the male.

566. *Albuna pyramidalis*, Walk.—One specimen near Billings's mill, July 10th, 1898.

HEPIALIDÆ.

567. *Sthenopis argenteomaculatus*, Harr.—I have a male in the collection taken near the head of Pine Creek in 1894, which has been so named by Dr. Dyar. Mr. Hudson took others, but says he never saw it anywhere but in one valley. I do not think that Alder, in the roots and stems of which the larva is said to feed, grows within four miles. It has not been met with in the same district for nine or ten years, but the locality has not been visited specially for it. Mr. C. Garrett seems to have found it not uncommon on Fallen Timber Creek, 20 miles west of Didsbury, in 1904, and I am indebted to him for two males and a female. One male is in colour exactly like Dr. Holland's figure of the species. All other specimens I ever saw, including the Pine Creek specimen named by Dr. Dyar, are smoky brown, with very little or nothing of an ochreous

tinge, and my only female has the darkest markings almost black, as dark, in fact, as the darkest in *Prionoxystus robiniae* in the figure Dr. Holland shows just above this species. The ochreous Didsbury specimen I picked out of about a score of pale ochreous and salmon-tinted *4-guttatus* and smoky-gray and brown *argenteomaculatus* as the nearest approach I ever saw to a connecting link between the two. It is, in fact, about intermediate, though I saw no intergrades with either extreme, and I was much surprised to find that it so closely resembled the figure in the "Moth Book." Flies at dusk in July.

568. *S. quadriguttatus*, Grt.—Fairly common some years, and seems to be generally distributed where there are willows, on the roots and in the stems of which the larva feeds. Mr. Heath tells me that he has found larvæ in roots of several other shrubs as well. I have no specimens quite as pale in ground colour as Dr. Holland's figure. Flies at dusk in July. Sir George Hampson said of a specimen I sent him: "*Argenteomaculatus*, not *quadriguttatus*," but I have not further investigated the matter.

569. *Hepialus hyperboreus*, Möschl?—About twelve years ago I used not to look upon this species as a rarity, but only one specimen has been seen for a good many seasons, on October 3rd, 1897. This and another defective specimen labelled "1894" are all I have. Dr. Dyar gave me the name *ganna*, a European species of Hubner's, of which *hyperboreus* was at that time considered a variety. My use of the above name is not authentic.

A RARE CARABID = *PLATYNUS QUADRIMACULATUS*,
HORN.

BY W. S. BLATCHLEY, INDIANAPOLIS, INDIANA.

Among a collection of beetles made by the late Dr. F. Stein, of Indianapolis, I found some years ago a specimen marked "*Platynus*, sp.? Indiana." Finding no description fitting it in Dr. Horn's revision of the genus,* I sent it among other specimens for naming to Dr. E. A. Schwarz, of the U. S. Division of Entomology. Under date of January 17, 1899, he wrote me that it was *Platynus quadrimaculatus*, Horn; that it "was not represented in the U. S. National Museum collection, and that only a few specimens had ever been captured."

On April 20, 1904, I was much pleased to find a second specimen beneath a chunk on a wooded slope bordering the flood plain of the

*Bull. Brooklyn Ent. Soc., V., 1882, p. 63.

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Wabash River, near Grand Chain, Posey County, Indiana. Snow a foot or more deep fell during the ensuing night and lasted several days, precluding further search at the time. Grand Chain is not a post office, but a series of rapids in the Wabash, about 20 miles above its mouth, and about seven miles below New Harmony, the home of Thomas Say. The Government has here done much work in trying to render the river navigable. For a number of years, about 1880, this work was under the supervision of Dr. Stein, and his specimen was doubtless secured near the same place.

I can find no reference to *P. quadrimaculatus* in any list or paper other than the original description by Horn.† He described it from a single female "collected by Mr. Klages, February 27, 1881, under the bark of a fallen gum tree near Owensburgh, Kentucky (banks of the Ohio River, near Louisville)." Grand Chain is about 45 miles north west of Owensboro, Kentucky, which is probably the town which Dr. Horn had in mind. The beetle doubtless belongs to the Austroriparian Fauna of the Lower Austral life zone, which extends over the greater part of the southern third of Indiana,‡ and should be sought for on the wooded slopes of the larger streams in early spring.

Quadrimaculatus is the most handsome of the 38 species of *Platynus* which I have taken in Indiana, reminding one of some of the more highly-coloured members of the genus *Badister*. Its most salient characters as given by Horn are as follows:

"Rufo-testaceous, sides of abdomen piceous, head black, elytron black, with a large humeral spot confluent with that on the opposite side, another very little smaller near the apex. Thorax somewhat cordiform, a little longer than wide, narrower at base, apex feebly emarginate, base truncate, sides in front arcuate, posteriorly sinuate, hind angles rectangular, but not prominent, an extremely narrow reflexed margin. Elytra oval, broader behind, humeral angles much rounded, body feebly winged, striate, striae obsoletely punctured, intervals flat, alutaceous, dorsal punctures three, on the third interval close to the third stria. Length, 7.5 mm."

†Trans. Amer. Ent. Soc., XII., 1885, p. 130.

‡See article entitled "The Life Zones of Indiana as Illustrated by the Distribution of Orthoptera Within the State," in the author's "Orthoptera of Indiana," 1902, p. 461.

FOUR OCHODÆUS NEW TO THE UNITED STATES.

BY CHAS. SCHAEFFER, MUSEUM OF THE BROOKLYN INSTITUTE
OF ARTS AND SCIENCES, BROOKLYN, N. Y.

Working over some neglected material, I found, to my surprise, that the specimens of *Ochodæus* collected by me last year in Arizona are separable into three distinct species, none of which agree with the descriptions of the North American species. A few years ago my brother sent me from California, with some other material, two specimens of what I take to be an *Ochodæus*. Unfortunately, I misplaced one of the specimens, and not wishing to dissect the single remaining one, I leave this species in this genus for the present, till more material is available.

Ochodæus planifrons, new species.—Male: Ferruginous-brown. Head sub-convex, granulate; clypeus short, transverse, broadly arcuate-truncate in front, feebly sinuate at sides, frontal margin single, clypeal suture feebly impressed, but visible; labrum deeply arcuate-emarginate. Prothorax moderately densely granulate, and with very short stiff semi-erect hairs, median impression obsolete. Elytra punctate-striate, intervals feebly convex, not densely punctate, punctures irregularly placed, each bearing a coarse, short hair, these are slightly longer at apex and sides than on the disk; sutural angle obtuse. Propygidium with a longitudinal, nearly parallel, median groove, apical margin strongly beaded. Mentum slightly longer than broad, deeply, longitudinally concave at middle. Prosternum arcuate-truncate in front. Anterior tibiæ tridentate, the upper tooth very small, and nearer the base than the second tooth. Posterior femora with a triangular tooth at apex; posterior tibiæ, inside at about apical fourth obtusely toothed or rather angulate; first joint of hind tarsi long, elongate. Body beneath moderately clothed with long hairs.

Female: Differs only from the male by having the hind tibiæ simple, the hind femora at apex with a smaller and more obtuse tooth and the clypeus slightly broader.

Length, 5 mm.

Huachuca Mts., Arizona. July and August.

This species, by the form of the male hind tibiæ, is very distinct from the described species, and is best placed after *Ulkei* in Dr. Horn's table.* The size, as usual, is variable; some are larger than the above measurement,

*Trans. Am. Ent. Soc., Vol. V., p. 180.

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others smaller; in the larger specimens the angulation on inner side of hind tibiae is more prominent than in the smaller specimens.

Ochodeus inarmatus, new species — Brownish-ferruginous. Head and clypeus coarsely rugose, front with a short transverse carina, which is emarginate at middle; behind the carina the surface is less coarsely sculptured than before; clypeus hemihexagonal, margin single, clypeal suture distinct, but feebly impressed. Labrum broadly, not deeply emarginate. Prothorax relatively coarsely and densely granulate and with very short recumbent hairs. Elytra striate-punctate, intervals feebly convex, moderately coarsely punctured, punctures irregular, and each bearing a short setiform erect hair; sutural angle sinuate. Apical margin of propygidium narrowly interrupted at middle with a small acute tubercle on each side. Mentum longer than broad, deeply longitudinally impressed from base to apex, the latter broadly emarginate. Prosternum arcuate in front. Posterior femora and tibiae simple. Body beneath sparsely clothed with moderately long hairs.

Length, 7 mm.

Huachuca Mts., Arizona. July and August.

The head behind and before the emarginate frontal carina is shallowly impressed. The two sexes do not seem to differ, except that the head in what I consider the female is less distinctly carinate and hardly at all impressed before and behind the carina; otherwise there is scarcely any difference in the large series before me, except in size. The measurement is taken from one of the larger specimens. This species has to be placed with *peninsularis*, near *biarmatus*, in Dr. Horn's table, from both distinguished principally by the emarginate frontal carina of the head. From the Mexican *luridus*, which has a similar armature of the head, it differs by the coarsely-sculptured head, the irregular punctuation of the elytral intervals and the larger upper tooth of the anterior tibiae, which is situated nearer the second tooth than the base.

Ochodeus praesidii, Bates, Biol. Cent. Am. col., Vol. II., pt. 2, 106.—

Male: Ferruginous. Head coarsely cribrate-punctate; front with a feebly-indicated carina; clypeus very narrow, with a double margin, the posterior margin more elevated and slightly more prominent at middle and at sides. Labrum feebly emarginate in front. Prothorax densely asperately punctate, with short semi-erect hairs and a posteriorly deeply-impressed dorsal line. Elytra punctate-striate, intervals feebly convex,

with irregular, not densely-placed punctures, each puncture with a recurved hair, finer and longer than in the preceding species; sutural angle obtuse. Propygidium longitudinally-grooved at middle, the sides of which are strongly divergent in front. Mentum as long as broad, suddenly narrowed in front into a small process, deeply impressed in about apical half. Prosternum broadly arcuate in front. Anterior tibiæ tridentate, the upper tooth small and further removed from the second tooth than from the base; posterior femora broad at apex, and with a large, slightly curved tooth; posterior tibiæ broad and somewhat flattened; first joint of posterior tarsi elongate, not curved. Beneath sparsely punctate and clothed with moderately long hairs, the last two segments more densely punctate than the rest of abdomen.

Female: Differs from the male by having the hind femora and tibiæ not as broad and the apical femoral tooth much smaller.

Length, 6.25-6.50 mm.

Huachuca Mts., Arizona. July and August.

Except in some minor characters, the specimens, which I refer to this species, agree well with nearly all the important ones used in separating the species in this genus, as far as given in the description. By the not entirely impressed mentum this species has to be placed with *mandibularis* and *frontalis*; from the first it differs by the form of femora and tibiæ and the different clypeus; some of these characters separate it also from *frontalis*, besides the different mentum. The frontal carina is at best feeble, and in some specimens entirely absent.

Ochodæus estriatus, new species.—Elongate, testaceous. Head flat, unarmed, densely punctate; clypeus very short, reflexed, clypeal margin single, thickened, arcuate; labrum strongly transverse, broadly emarginate. Prothorax punctate, punctures well separated, median line impressed, obsolete near apex. Elytra irregularly, not very densely punctate, without striæ, except an impunctate sutural, surface pubescent with fine, short hairs; sutural angles rounded. Prosternum in front subangulate at middle. Anterior tibiæ strongly tridentate; intermediate tibiæ strongly dilated towards apex and shorter than the femora; posterior trochanters prolonged into an acute process, posterior femora with a triangular, obtuse tooth slightly before apex, posterior tibiæ simple, broad and short, outer side straight, inside arcuately widening to apex; first joint of posterior tarsi elongate, as long as the three following joints; spurs of middle and

hind tibiæ dissimilar, the outer is slender and the inner pectinate on its inner margin. Body beneath, especially the abdominal segments, densely hairy.

Length, 7 mm.

Millwood, Fresno Co., California. One specimen collected by my brother.

The more elongate form, the short, strongly-widening middle and hind tibiæ, the spinous hind trochanters, the elytra without striæ, and the strongly-reflexed or rather strongly-thickened apical margin of clypeus will readily distinguish this from any of the described species; it is also remarkable by having one spur of both the middle and hind tibiæ pectinate.

This species may require a new genus, but without dissection it was impossible to find characters strong enough for such a course, and till more material is available it is best placed in *Ochodæus*, apparently possessing the characters required for this genus.

NEW SPECIES OF GEOMETRIDÆ.

BY JOHN A. GROSSBECK, NEW BRUNSWICK, N. J.

Stenaspilates flavisaria, new species.—♂. Expanse, 33–38 mm. Head, thorax and abdomen yellowish-white. Ground colour of wings yellowish-white, in some specimens washed with a fawn-brown tint. Primaries with a dark-ochreous intradiscal line crossing one-third from the base, curved broadly outward from costa, then bisinuous to inner margin. Extradiscal line brown, bounded outwardly by a narrow white line, crossing at the outer third, with a gentle outward and inward curve to cubitus 2, then with a sharp outward semicircle, and another short curve to inner margin. The basal area is more or less shaded by pale brown ochreous, most obvious toward the base of the inner margin. The central area pale ochreous to fawn-brown, darkest at the extradiscal line, becoming paler toward intradiscal line. Discal spot white, linear, distinct. The outer area with a sparse sprinkling of brown scales, the inner portion with a whitish shade at the costa, which also extends more or less through the centre of the area. The outer margin distinctly angulate at media 1 and cubitus 2. Secondaries usually with a transverse line beginning at inner margin and fading away toward costa, which corresponds to the extradiscal line of primaries; within this line the area is pale ochreous, gradually merging into the ground colour toward the base. Discal spot large, rounded, rather faint. The outer area with a sprinkling

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of brown scales, and an indistinct cloud occupying the central portion. Near the anal angle is a distinct black dot. Outer margin of wing sinuous, decidedly scalloped at anal angle. Beneath the wings are yellowish-white, with the outer lines very faint. The discal dot of the secondaries dark brown, large and distinct.

♀.—Expanse, 40-43 mm. Body and ground colour of wings much more yellow than in the male, and entirely lacking the fawn-brown tint; the scattering brown scales, therefore, stand out more in contrast, those of the outer area collecting into numerous short dashes. Lines, discal spots, etc., as in the male. The extradiscal line is, in most specimens, more sharply marked, and the shading of the central area is distinctly ochreous, without tendency toward the fawn-colour, and also much paler in the central portion. In the outer area, running parallel to the extradiscal line, and giving prominence to the narrow white line, is a broad grayish-brown band, which commences a short distance from the costa, and becomes obsolete as it rounds the semicircle. Beneath a broad brownish band crosses both wings, beginning at the costa and extending two-thirds across the wings.

Described from five males and thirteen females, Yavapai Co., Ariz., May 22-31; one male from Minnehaha, Ariz., Aug. 30 (Hutson); and one male from Yuma Co., Ariz., Aug. 26 (Pearsall).

Types, coll. J. A. Grossbeck; co-types, coll. R. F. Pearsall, and in Rutgers' College collection.

Seems to be very distinct from any other described species. There is some variation in the intensity of the colouring, several being pale, with intradiscal line of primaries and transverse line of secondaries obsolete, while in others they stand out in bold contrast. The specimen from Minnehaha is exceptionally dark, being heavily washed with gray, and the fawn colour of the median area correspondingly heightened, and at first sight suggests an entirely different insect. One of the earlier captures approaches it somewhat, being intermediate between the two extremes. The capture of this specimen in August seemed at first to be untimely, hence the exceptional colouring; but the later acquisition of a second August specimen from Mr. Pearsall seems to establish a second brood without further doubt.

Stenaspilates Smithii, new species.—♀. Expanse, 40 mm. Head and thorax brownish-black, with a sprinkling of cinereous scales; abdomen with evenly mixed blackish and cinereous scales except at the apex of

each segment, which is wholly brownish-black. Ground colour of wings grayish, with dark brown scales scattered over the entire surface. Intradiscal and extradiscal lines of primaries as in *flavisaria*, but the sharp outward curve of the latter below cubitus 2 more acute; both lines black and sharply defined. Another blackish line is traceable crossing the primaries from costa to inner margin, close to their insertion into the thorax. The basal area has an almost even scattering of brown scales, fewer toward the intradiscal line. The inner half of the central area is evenly covered with gray and brown scales, but the outer half is very dark brown, scarcely any cinereous scales showing, and a slightly darker line subparallel to the extradiscal line is faintly seen running through this dark portion. Discal spot pure white, linear, angulate. The outer area is irregularly divided into two distinct colours, the line of division running somewhat the same as the extradiscal line, the inner portion cinereous, with scattered brown scales and a brunneous patch in the centre and toward the costa; the outer almost wholly brown, with two or three white dots in a line in the centre of the apical half. Secondaries gray, with a faint yellowish cast, sprinkled with fine brown scales, thickest toward the anal angle. A rather strong brown line, edged outwardly with white, extends from the inner margin near the anal angle transversely across the wing to the costa, ending one-fourth in from the apex; this line becomes narrower and fainter as it nears the costa, and the white border becomes correspondingly weakened. The marginal line is most distinct toward the anal angle, where it appears as three black crescents bordering the marginal excisions. Discal spot absent. Margins of both wings as in *flavisaria*. Beneath the wings and body are dirty gray, with a yellowish tinge, and with fine scatterings of brown scales. On the primaries the white discal spot of upper surface is reproduced, while the extradiscal line is scarcely to be made out. On the secondaries the brown scales form short dashes toward the inner margin and anal angle, transverse line very conspicuous on inner half; discal spot large, round, dark brown.

Described from one female from Doble, California, taken in August.

Type in Rutgers College, from coll. Dr. J. B. Smith.

This is by far the darkest of all the species of *Stenaspilates* found in the United States, and by that fact alone may be distinguished from its congeners occurring in the same territory. I take pleasure in naming this fine species in honour of Dr. John B. Smith, to whom I am indebted for innumerable kindnesses of all descriptions.

Eucestia fuscata, new species.—♂. Expanse, 24.5 mm. Front, antennæ and thorax fuscous, with a sprinkling of white scales; palpi white at basal and fuscous at apical half; vertex wholly brown. Ground colour of primaries whitish-cinereous, thickly overlaid with fuscous scales. Three parallel whitish lines, the inner beginning one-fourth from the apex on the costa, and terminating one-third from the inner angle on the inner margin, extend obliquely across the wing, curving outward at radius 5, and inward at cubitus 2. These lines are almost obsolete a little below radius 5 to media 2, the innermost showing most plainly. The outer line in the apical portion of the wing deeply scalloped. The terminal line deep fuscous, preceded and narrowly broken by whitish scales. The basal line is represented by an oblique, rather broad mark, in the centre of the wing, slightly nearer the inner margin. The discal spot is deep fuscous, linear. Veins, media 1, media 3 and cubitus 1 are darkened by fuscous scales from the centre of the wing to the inner transverse line. Fringe checkered white and pale fuscous. Secondaries smoky brown, slightly darker at the apex, and with darker squares in the fringe. Beneath it is pale smoky brown, peppered with white scales along the costa and outer margin; the fringe checkered as above.

Described from one male received from Dr. J. B. Smith, taken at Colton, Cal., Feb. 26.

Type in Rutgers College, from coll. Dr. J. B. Smith.

In spite of the close similarity of the markings to *Eucestia rotundata*, I am positive that this will remain a good species. The outward curvature of the transverse white lines and the suffusion of fuscous scales, combine to make the species distinct.

THE SNOW FLY, *CHIONEAL VALGA*.

BY C. N. AINSLIE, ROCHESTER, MINN.

From allusions that are met with in papers and letters, the Snow Fly seems to be to most collectors a mythical insect, seldom described and more infrequently found. The late Dr. Lugger claimed to have taken it in Minnesota, but, a short time before his death, when he undertook to show me an example of the insect, it could not be found either in his own or the State collection. It is true he figured it in his Second Annual Report, issued in 1896, but that and the figure in the last State report, 1905, are

somewhat misleading, and fall short of an adequate representation. Indeed, it is next to impossible to represent the fly as it appears in actual life, "ambling" across the landscape, for to my mind it resembles a clumsy little black spider more than anything else.

A neighbour of my boyhood days used to tell me of a fly that he had found at times in the snow, although I believe he called it a "snow flea," but his ideas on other subjects were peculiar, and I gave scant credence to his fly stories. Professor Lugger and I have several times waded patiently through snow, looking carefully for this insect, but never until last Christmas did I ever see one. My son and myself were walking along a little-used road on top of a bluff at the edge of this city late in December last, when we were met by one of these strange fellows, staggering actively along the sleigh track toward us. It was a winter afternoon, the sun almost setting, the snow a foot deep, or more, the surface snow at least ten days old, a cool breeze blowing, and the mercury 15 degrees above zero, Fahr. I recognized him at a glance as I would an old friend, and, gathered him in. It was a male, and when touched feigned death, but in a few seconds started on again. In a vial in the warmth of my pocket it died within a few minutes.

Two days later my son searched the same vicinity carefully during the forenoon and took two more, a male and female, which mated instantly when bottled together. This pair was kept out of doors that night under an inverted glass on snow, but the next morning were both dead, or nearly so. The snow below the glass was carefully melted, but no trace of eggs was found.

The fly appears black when seen against snow, but is really a blackish-gray, the body velvety and soft. The halteres are prominent. The legs are the most striking feature in the make-up of the creature, and are three or four times as long as the body, loosely attached as in the Tipulidæ. The body is about three millimetres in length, besides the antennæ, which are peculiar in shape and are inadequately represented in the delineations referred to above. •

The life-history of the Snow Fly has been partially worked out in Europe, but under the conditions of life in which it exists in this vicinity it would certainly be exceedingly difficult to follow successfully, except in rare cases.

SOME BEES FROM WASHINGTON STATE.

BY T. D. A. COCKERELL, BOULDER, COLO.

The State of Washington is remarkable for the possession of two very different faunæ: that of the damp coast region, and that of the inland plains and valleys.* The bees of the coast region have become fairly well known through the collections of Professor T. Kincaid and others, but the inland bee-fauna has as yet yielded to science only a fraction of its riches. On May 25, 1896, Professor Kincaid collected at Pasco, and obtained a remarkable series of specimens, including new species of *Colletes*, *Andrena* (two), *Nomada* (two), *Calliopsis*, *Osmia*,† *Anthophora* and *Emphoropsis*. The results of this single day's work will ever be memorable in the history of Apidology, and from this and other miscellaneous collections, we may fairly assume that the region contains a whole new fauna. Not long ago Mr. Titus passed through Pasco, and found it a desolate-looking place; the region is not one of luxuriant vegetation, but represents the northern extension of the arid desert or semidesert, carrying with it an essentially southern bee-fauna, as shown by *Calliopsis*, *Dasiapis*, *Nomia*, etc.

When Mr. A. L. Melander went to Washington State, I hoped that he would in due course give us an account of the interior country, and make known its real possibilities in the way of Hymenoptera. This he is beginning to do, for the other day I received from Mr. Viereck a box of bees, transmitted to him by Mr. Melander, with the request that they should be worked up. Although I was more than occupied in other ways, they were so interesting that I could not do otherwise than examine them, and I give here part of the result.

Emphoropsis cineraria (Smith).

Yakima, Wash., April 21, 1905. ♀. Previously known only from Vancouver I.

Anthophora.

The following were taken by Eldred Jenne at N. Yakima, Wash., in 1903: *A. Crotchii*, Cr. (May 24); *A. simillima*, Cr. (May 9); *A. urbana*, Cr. (June 26); *A. Washingtoni*, Ckll. (May 27); *A. ignava*, Cr. (May 23); *A. sodalis*, Cr., both sexes (May 27); and *A. Edwardsii*, Cr. (May 9).

*See *American Naturalist*, Jan., 1899, pp. 41-42.

†*Osmia Pascoensis*, Ckll., discovered at Pasco, was taken by me at flowers of *Carduus*, at Boulder, Colorado, July 3, 1905.

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The following are from Yakima, Wash., 1905: *A. Edwardsii*, Cr. (April 20 and 21); *A. Crotchii*, Cr. (April 21).

All these appear to be new to the State, except *Washingtoni* and *Crotchii*. The latter is omitted by Mr. Viereck in CANAD. ENTOM., 1905, p. 313, but it was recorded from Pasco in *Proc. Acad. Nat. Sci., Phila.*, 1898, p. 54.

Tetralonia Yakimensis, n. sp.

♂.—Length about $13\frac{1}{2}$ mm.; black, the clypeus (except a deep rounded incision on each side) rather light lemon-yellow, the labrum yellowish-white; hair of head and thorax dullish pale ochreous; abdomen with the first segment covered with very pale ochreous hair, the remaining segments with coarse black hair, with no light hair in front of the apical plate, nor any bands; tarsi, especially the small joints, rufescent; hair on inner side of basal joint orange; basal joint of middle tarsi twisted, and with an apical projection; hind spurs normal. Runs in my tables (Tr. Amer. Ent. Soc., 1906) to *T. Californica* (Cr.), from which it is easily separated by the black hair of second abdominal segment, and absence of reddish hair on apical part of abdomen. By the coloration of the abdominal hair, it resembles *T. acerba*, but that is smaller, and has not the deformed middle tarsi. The closest affinity is no doubt with *T. fulvitaris* (Cr.), which has just the same leg-structure. *T. Yakimensis* differs from *fulvitaris* by its more robust form; the hair on second abdominal segment black instead of pale; the absence of a light tuft before the apical plate; the piceous instead of ferruginous nervures; the yellowish (instead of white) hair of legs; the dull disc of mesothorax, with less conspicuous punctures. The facial quadrangle is much longer than broad, the yellow of the clypeus almost touches the eye, and the mandibles have no yellow spot. The antennae are practically as in *fulvitaris*.

Hab.—Yakima, Washington State, April 21, 1905 (*Melander*). Received through Mr. Viereck.

Tetralonia Douglasiana, n. sp.

♀.—Length about $14\frac{1}{2}$ mm., the light pubescence gray to white, only very faintly yellowish on thorax above; hair on inner side of basal joint of hind tarsi clear ferruginous; flagellum very faintly reddish beneath; tegulae ferruginous, fuscous basally; abdomen with very broad bands of white tomentum on segments 2 to 4; the white band on 5 very broadly interrupted in the middle by dark rufo-fuscous; wings dusky, with a yellow tint, the nervures piceous; no dark hair on mesothorax or

scutellum; facial quadrangle somewhat broader than long; hind spurs pale ferruginous, not at all hooked. The scopa of the hind tibiae is slightly plumose only, as in *T. Belfragei*. In my tables this runs (making allowance for the large amount of white at sides of segment 5) to *T. Cordleyi*; if sought in the series with the apical hair reddish, it runs to *T. speciosa* or *Cordleyi*. It differs thus from various species which might be confused with it:

1. From *speciosa* by its smaller size, silvery white (not yellow) hair of hind tibiae, different colour of hair of apex, gray hair of mesothorax, etc. The pale bands on segments 2-4 are as in *speciosa*, except that that on 2 is not appreciably narrowed in the middle, and that on 3 has its upper edge straight (strongly concave laterally in *speciosa*). The bands are also whiter.

2. From *Cordleyi* by the whiter and much broader abdominal bands, the upper lateral corners of the second segment being covered with pubescence; whereas in *Cordleyi* they are broadly black. The hair of the mesothorax is also quite differently coloured.

3. From *Belfragei* by the much broader light bands of abdomen, and the dullish gray aspect of the whole abdomen, instead of the clear black and white of *Belfragei*.

4. From *Fowleri* by the larger size, much broader band on second abdominal segment, etc.

5. From *virgata* by the hair of mesothorax, ornamentation of abdomen, etc.

Hab.—Steamboat Rock, Grand Coulee, Douglas County, Washington State, July 10, 1902. Received from Mr. Viereck, who received it from Mr. A. L. Melander.

Nomia Melandri, n. sp.

♀.—Length about $12\frac{1}{2}$ mm.; hind margins of abdominal segments 2 to 4 with very broad light emerald-green tegumentary bands; first segment with a little green at the hind corners. Closely allied to *N. Foxii*, D. T., but larger (though not nearly so large as *N. Nortoni*), and differing as follows: anterior part of mesothorax with very pale grayish-ochreous hair, with black bristles intermixed; posterior part of mesothorax mainly exposed, shining, impunctate, except for a few large punctures near the region of pubescence, and scattered scarcely visible rudiments of

punctures; scutellum smooth and almost impunctate; apical depression of first abdominal segment bounded above by a strong ridge, which is concave toward the depression (in *Foxii* the depression is less conspicuously bounded, and the boundary is straight); first r. n. entering second s. m. a little beyond the beginning of its last third. Otherwise *Foxii* and *Melandri* are about the same, but the difference of thoracic sculpture makes the latter a very easily-separated species.

Hab.—N. Yakima, Washington State, July 10, 1903, "Yakima Expedition." Sent by Mr. A. L. Melander to Mr. Viereck, who transmitted it to me.

Sphecodes Columbie, n. sp.

♀.—Length about 11 mm., of anterior wing just over 7 mm., width of abdomen about $2\frac{2}{3}$ mm.; head and thorax black, abdomen long, entirely bright yellowish-ferruginous; legs black, only the small joints of tarsi dark reddish; wings strongly brownish in the region of the cells; flagellum stout, the apical half obscure reddish beneath; third antennal joint longer than fourth, and somewhat longer than broad; labrum broad, not emarginate, nor much produced; mandibles stout and blunt, wholly without an inner tooth; clypeus with very large partially-confluent punctures. This was taken, at first sight, for *S. Kincaidii*, but it is not that species. With the large size and simple and dark mandibles of *Drepanium*, it combines the ordinary labrum of *Sphecodes*, etc. It agrees with the description of *S. Kincaidii* except as follows: Size smaller; face with scanty dull white pubescence, but also, coarse black bristles; antennæ not wholly dark; first joint of flagellum not so short; mandibles simple; mesothorax with large strong punctures on a shining ground posteriorly, but rugose anteriorly; tegulæ with hyaline margins; stigma ordinary, not especially large; hind tarsi not all red; second abdominal segment with small close punctures basally; third punctured like the second, except that the area of small close punctures is larger. The first segment, and the second and third except basally, have scattered strong punctures on a very shiny ground; apex with dark hair; apical plate small and narrow; second submarginal cell very narrow, much higher than broad, receiving the first r. n. near the beginning of its last third; area of metathorax hemispherical in outline, regularly cancellate, with a very sharp and definite rim. By reason of the area of metathorax, the smooth sparsely-punctured base of abdomen, etc., one is reminded of *S. arroyanus*, which, however, differs from *S. Columbie* by the shorter area of

metathorax, with much less definite cancellation, the paler hair of apex of abdomen, the copious pale hair of face, the shining and strongly-punctured anterior part of mesothorax, the smaller and darker tegulae, etc.

Hab.—Grand Coulee, "Columbia River," Washington State, July 12, 1902. Sent by Mr. Melander to Mr. Viereck.

Dasiapis ochracea, Ckll.

♂.—N. Yakima, Washington State, June 26, 1903, two (*Eldred Jenne*). Like a *Diadasia*, but the clypeus of the male is cream-coloured. Not previously known north of New Mexico and Arizona; it well illustrates the northward extension of the southern fauna in the interior region west of the Rockies.

Nomada Jennei, n. sp.

♂.—Length about 8 mm., anterior wing just over 6; black, with creamy-white markings; thorax and upper part of head coarsely rugosopunctate; abdomen very finely and closely punctate, giving it a dullish and rough appearance, though the punctures are strong and perfectly distinct, as seen with the compound microscope; head broad; eyes pale gray; middle of face with conspicuous appressed silvery-white hair; labrum, basal part of mandibles, clypeus and lateral face-marks creamy-white; mandibles simple, dark at apex, with bright ferruginous between the dark and the light; no supraclypeal mark, except a faint and suffused reddish spot; a black notch at upper junction of clypeus and lateral marks; lateral marks narrow except at base, ending at level of antennae, the end broadened and obliquely truncate; scape fairly stout, creamy-white in front; flagellum ferruginous, suffused with black above, its first joint scarcely half the length of second (slightly over half on the long side, but conspicuously less than half on the short); tubercles, a pair of minute and obscure dots on upper part of prothorax, and a pair of large round mammiform elevations on scutellum, creamy white; metathorax all black; pleura with a large transverse ferruginous patch, on which are two large creamy-white patches; tegulae testaceous, with a large creamy-white mark; wings clear, with the apex dusky; stigma amber-colour, nervures fusco-ferruginous; b. n. meeting t. m. slightly to the basad side; second s. m. broader above than third, and receiving the first r. n. a little beyond its middle; legs ferruginous, marked with black and creamy-white; all the tibiae have the apex externally broadly white; the hind tibiae are dark, with the base and apex white; the anterior and middle femora have the lower margin broadly blackened for about the basal two-thirds, but on the

apical third is a white dash; tarsi all red; abdomen black at base, but the other dark parts largely reddish, though never bright; each segment has a broad creamy-white band, those on the first two interrupted by a red line in the middle; the first three bands have a dark notch sublaterally on the posterior edge; the fourth has a dark spot on each side; and the fifth has the notch deep and on the anterior edge; apical plate notched; venter ferruginous, banded with white.

Hab.—N. Yakima, Washington State, Sept. 26, 1903 (*Eldred Jenne*). The abdomen is marked and coloured much as in *N. Crotchii*, var. *nigrior*, but the sculpture is different. The closest affinity is probably with *N. Pascoensis*, which is quite differently coloured. Although the anterior coxæ are not spined, they have a minute red tubercle, only distinctly seen with the compound microscope, and I believe the insect is not without real affinity to *Micronomada*.

THREE NEW SPECIES OF BEES.

BY J. C. CRAWFORD, DALLAS, TEXAS.

Perdita Cockerelli, n. sp.—♂. Head and thorax green, finely roughened, metathorax sometimes more bluish; face up to antennæ, including labrum and mandibles, except tips, lateral face-marks running to a point about half way between point of insertion of antennæ and summit of eyes, narrow inferior orbits half way up, scape in front, large spot on tubercles, connected with a spot on prothorax and also with coxal cavity, spot on tegulæ, all of legs except black stripe on rear of anterior and intermediate femora and tibiæ and basal half of all coxæ, yellow; black stripes on front and rear of hind femora connected below, hind tibiæ black, with a yellow stripe in front, flagellum reddish testaceous below; wings milky hyaline, nervures pallid, costa, radius more or less and margin of stigma brownish; tegulæ pallid; pubescence of head and thorax long, white, abundant on pleura and cheeks, tarsi yellowish testaceous, hind tarsi dark; abdomen brownish black, segments 1-5 with yellow bands narrowly interrupted medially; that on 5 sometimes reduced to two spots; venter yellow, tip dark.

Length, $5\frac{1}{2}$ to 6 mm.

♀.—Similar to ♂ in colour, the markings cream coloured and confined to following: clypeus, except two dots and two longitudinal lines parenthesis shaped, not reaching base of clypeus or these connected with the dots or broken medially, supraclypeal mark two dots, or these

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connected or entirely absent, lateral face-marks as high as insertion of antennæ, mandibles basally, spots on prothorax and scape in front, knees, line on front of anterior and intermediate tibiæ; bands on segments 1-4 slightly yellowish, interrupted, sometimes widely, that on 5 reduced to two dots or absent; nervures somewhat darker than in ♂; pygidium red; abdomen black; legs black, tarsi dark.

Length, 8 to 8½ mm. Type locality, West Point, Nebr.

Seven females with supraclypeal marks; five females without; eight males; all on *Grindelia squarrosa*. Sexes taken in copula.

This is ♀ *Bruneri* "larger than usual" of Professor Cockerell in the Entom., XXXIV, 190, July, 1901. *Bruneri* ♀ is smaller, has the supraclypeal mark always present and square (*Cockerelli* usually has it, but only as two spots, or these partly connected, never entire); abdomen black, markings with no yellow tinge; *Bruneri* ♂ is easily distinguished by the face being yellow for some distance above antennæ; hind legs with no yellow. The female runs in Cockerell's Tables of New Mexico Bees to *verbesinæ* when without supraclypeal mark; with it to *affinis* ♀ var.; the male runs out of the table at 28 when counting nervures pallid, and when dark at 32.

Neopasites Robertsoni, n. sp.—♀. Black, dull, coarsely and closely punctured, face above antennæ, mesothorax, scutellum and post-scutellum above, appearing reddish-brown from short fine silky hairs; face below antennæ, line on prothorax, median and parapsidal grooves anteriorly, most of mesopleura, posterior angles of mesothorax, edges of scutellar lobes, edges of post-scutellum, sides of metathorax and coxæ with white appressed scale-like pubescence; clypeus anteriorly, mandibles, tibiæ and tarsi light reddish; antennæ beneath and tubercles slightly darker; tegulæ largely reddish; scutellum deeply bilobate; wings dusky, nervures and stigma dark; second submarginal narrowed fully two-thirds to marginal; femora dark; apical margins of abdominal segments reddish, inclining to golden; segment 1 with two large spots of appressed white pubescence on disc connected anteriorly with two small spots on the lateral margins; segments 2-5 with four small almost equidistant spots of similar hair, the outer ones being on the lateral margins of the segments; apical segment truncate; ventral segments with the apical margins reddish.

Length about 4½ mm. Lincoln, Nebr., Aug. 27, 1902; on *Solidago*.

♂.—Similar to ♀; legs more testaceous; first recurrent nervure received well before the base of the 2nd submarginal cell, not at base as

in the female ; median pair of spots on segment 1 smaller, apical dorsal segment narrow, rounded at tip.

Length slightly more than 4 mm. West Point, Nebr., Aug. 30, 1903; on *Solidago*.

Distinguished from *heliopsis* by being smaller, not so closely punctured, large spot of pubescence on pleura, reddish tinge of head and thorax above, spots on abdomen white, not tinged with yellowish, lighter coloured legs, etc.

Halictus pruinosiformis, n. sp.—♀. Entirely bright green, pubescence rather abundant, white ; facial quadrangle about square ; face closely, rather coarsely punctured ; antennæ dark ; mesothorax finely lineolate, coarsely, rather closely punctured ; metathorax with coarse, very irregular striæ not quite reaching apex, the apical part rather coarsely roughened ; truncation not surrounded by a salient rim ; wings hyaline, stigma honey colour, subcosta dark, nervures very light, those surrounding the marginal cell darker ; tegulæ dark brown ; legs dark, pubescence white ; hind inner spur light-coloured, with about four long teeth ; abdomen finely closely punctured, first segment more sparsely so, apical margins of segments testaceous ; abdomen, except discs of segments 1 and 2, covered with white sub-appressed pubescence ; very often this pubescence is worn almost entirely off.

Length about 6 mm.

♂.—Similar to ♀ ; facial quadrangle slightly longer than broad, only slightly narrowed below ; antennæ reddish testaceous beneath ; clypeus anteriorly dark ; nervures as in the female, but the darkened ones darker and more contrasting : metathorax roughened at base, and with a median longitudinal line not reaching apex ; on each side of this there is a depression, so that it appears as if the line divided at rear and ran laterally and then to front, leaving a narrow smooth shiny border ; abdomen, including the first segment, more distinctly and coarsely punctured than in the female, and only sparsely pubescent.

Length about 6 mm. Types : Fedor, Texas, March 8, 1902 (♀) ; May 17, 1904 (♂). (Birkmann coll.)

Paratypes : Fedor, Texas ; Boulder, Colo. (W. P. Cockerell.)

This species is the colour of *pruinus*, but the wider facial quadrangle and coarse punctures of the mesothorax separate it in the female ; the male has a much wider face than *pruinus*, and has the metathorax much less rugose.

ON WING-VEIN NOMENCLATURE.

BY JOHN A. GROSSBECK, NEW BRUNSWICK, N. J.

It will be noticed that in the preceding paper on *Geometridæ*, I have used the Comstockian terms for designating wing-veins. Heretofore these have not been used by any writers on this family of moths; in fact, they have been very little used by writers in any family. The reason for this is, not that the system is not a good one, but because it is comparatively new. Most of the older writers have become used to the number system, having employed it in all their previous work, and therefore retain it to preserve uniformity, and perhaps make no effort to familiarize themselves with the new dispensation.

There is no reason, however, why the new generation of entomologists should not adopt a system of nomenclature which, as it applies to insects of all orders, is obviously a more natural one. Dr. John B. Smith, a rather conservative entomologist in my opinion, has, in the Glossary he has just completed for the Brooklyn Entomological Society, laid the foundation for the more general adoption of the new system by using one of the plates to illustrate wings of various orders, and attempting to reduce all terms defined in the text to terms used in these figures. This is an obvious step toward bringing the system into more general use, though Dr. Smith, as an older entomologist, may continue to use the number system in his future work on *Noctuidæ*. The number of synonyms to the few names Prof. Comstock employs to cover the entire wing venation is surprisingly great (as may be seen by referring to the above-mentioned Glossary), and there could be no better illustration of the need of bringing the terminology to a simple and rational basis.

SINGULAR LOCALITY FOR A WASP'S NEST.—On Mount Royal, on the outskirts of Montreal, there are two large cemeteries, the Roman Catholic and the Protestant. In the former, far up in a lonesome spot among the trees is a Calvary—three huge crosses; the centre one bearing a life-size figure of the Saviour, and the two side figures representing the two thieves. One thief—the penitent one—is represented hanging his head as if dead, the other thief as living and railing at the central figure. For several years past, hornets have each summer built a nest immediately at the back of the impenitent thief, between the hollow of the back and the cross, and can be seen flying in and out from each side during the whole season. So far they have never built a nest behind the other two figures, and the faithful in the city attach great significance to this curious circumstance.

At another piece of sculpture representing the tomb at Gethsemane, with a recumbent figure of the Saviour, there is a bush with a branch hanging over the tomb, and on this a yellow bird has built its nest. The selection of sites by wasps and bird is regarded as being very remarkable and suggestive.

M. WARING DAVIS, Montreal.

BOOK NOTICES.

ENTOMOLOGY, with special reference to its Biological and Economic Aspects.—By Justus Watson Folsom, Sc. D., Instructor in Entomology at the University of Illinois. Octavo, pp. 485, five plates and 300 other illustrations. P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia. (Price \$3.00.)

Of recent years a number of text-books, more or less complete, have been placed before the public, but none has been prepared with the object that the author of this new work has in view. The Insect Book, the Butterfly and Moth Books, Comstock's and Kellogg's Manuals, all treat of insects largely from the systematic standpoint, detailing their information according to families. Packard's valuable "Text-book" reviews our knowledge of structure and development. Smith's Entomology is our most complete economic book. But the vast array of facts and the many theoretical problems that have appeared in various publications concerning the other phases of insect study, have never before been accumulated and digested in any American text-book.

Dr. Folsom is a teacher, and has prepared his book principally to fulfil the requirements of certain college courses in entomology, which have not hitherto possessed a comprehensive text-book. Accordingly, the Classification of Insects, which has been so fully treated in the above-mentioned works, serves but for a short introductory chapter, and is followed by two long chapters, occupying about a third of the volume, on Anatomy and Physiology, and Development. When the student has mastered this portion of the book, his laboratory work will have afforded him a sufficient acquaintance with a large number of typical insects to enable him to appreciate the remainder, which is the really distinctive part of the work. To the collector and general reader of the CANADIAN ENTOMOLOGIST, who may not have access to libraries, or have had the advantage of a college course, but who do know the haunts and habits of the insects they search for, this portion of the work will prove an inspiration. The titles of the chapters, which alone we give, should certainly stimulate a desire to penetrate further and learn the impartial consideration that the author has given to the problems of entomology. The following are the subjects of chapters 4 to 13: Adaptations of Aquatic Insects, Colour and Coloration, Adaptive Coloration, Origin of Adaptations and of Species, Insects in relation to Plants, Insects in relation to other Animals, Interrelations of Insects, Insect Behaviour, Distribution, Insects in relation to Man.

These several topics may be treated of in other works, but in none so completely as in the more than two hundred pages that Dr. Folsom devotes to them. The volume concludes with a very full classified bibliography and a necessary index. The plates and other illustrations, a large number of which are original, are excellent, and add greatly to the value of the work.

A. L. MELANDER.

We wish to add our testimony to the excellence of Dr. Folsom's new work on Entomology. As a text-book it covers a field hitherto unoccupied, and will, we are sure, prove most useful to teachers and students in scientific and agricultural institutions, and will also be found instructive and interesting by all who are in any way devoted to the study of insects. It should find a place on the book shelves of every working entomologist, and when there will be constantly referred to and consulted. It is written in a clear and attractive manner, and is replete with information gathered from many sources, and including the most recent discoveries and investigations. We congratulate the author on the completion of an admirable piece of work, for undertaking which he deserves the grateful thanks of all North American entomologists.

C. J. S. BETHUNE.

EXPLANATION OF TERMS USED IN ENTOMOLOGY.—Prepared by John B. Smith, Sc. D., Professor of Entomology in Rutgers College, etc. Published by the Brooklyn Entomological Society, Brooklyn, N. Y. (Price, \$2.00.)

Every Entomologist has, no doubt, been at a loss from time to time regarding the exact meaning of some term that he has met with in a descriptive article on some group of insects in which he is interested. He may have been able to guess the meaning from its obvious derivation from Greek or Latin, or to ascertain it by consulting a comprehensive dictionary. On the other hand, his knowledge of classical languages may be slight and no library may be available, and thus he is left in doubt regarding the term which is of much importance to a right understanding of the article. Thanks to Dr. Smith's careful work, he may now be relieved of this difficulty; the Glossary just published will fulfil all his wants in this respect and a reference to it will give in a clear and concise form the meaning of the hitherto unknown term.

The volume contains over 150 pages, and at a rough calculation between four and five thousand terms. We have tested it in many cases and have also dipped into it at random here and there; in every instance

we have found the word looked for and been satisfied with the definition given. As the author states in the preface, the work cannot, in the nature of things, be regarded as perfect or complete, but it is as nearly so as one can expect, and every one who discovers an error or omission should at once make it known to the author in order that when another edition is published the highest possible standard may be reached.

The four plates at the end of the book will be found most useful. They show the Structures of the External Body Wall of several typical insects, those of the Head, Mouth, Thorax and Genitalia, the Venation according to the Comstock system, and the Nomenclature of Colours.

C. J. S. B.

BULLETIN OF THE BRITISH COLUMBIA ENTOMOLOGICAL SOCIETY.—No. 2, June, 1906.

The second quarterly issue of this four-page publication has been received. It contains a valuable paper on "System in Collecting," lists of remarkable captures, Notes on the Season, etc., and a continuation of the B. C. List of Coleoptera, comprising the Buprestidæ, and the beginning of the Diptera, families Bombyliidæ and Therevidæ. The spring meeting was held at Duncan's on April 19. Our friends on the Pacific Coast are certainly working enthusiastically and diligently exploring their most interesting province of the Dominion.

STUDIES IN THE GENUS *INCISALIA*.—Mr. John H. Cook regrets to announce that he will be unable, through pressure of other work, to continue this series of papers until autumn. The next instalment will be published in October or November.

CHANGE OF ADDRESS.

All correspondence, books, exchanges, etc., for the Entomological Society of Ontario or the CANADIAN ENTOMOLOGIST, should in future be addressed to

GUELPH, CANADA,

and not, as heretofore, to London, Ontario.

Mailed August 3rd, 1906.

